

Another new species of *Grosphus* Simon (Scorpiones, Buthidae) for Madagascar

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Another new species of *Grosphus* Simon (Scorpiones, Buthidae) for Madagascar. - *Grosphus garciai* sp. n., the tenth representative of the genus *Grosphus* Simon (Scorpiones, Buthidae), is described from the Ankarafantsika Reserve in Madagascar. A revised key to the species of *Grosphus* is given.

Key-words: Scorpion - *Grosphus* - new species - Madagascar - Ankarafantsika Reserve.

INTRODUCTION

The genus *Grosphus*, with nine nominal species, is known to occur only in Madagascar. The first species was described under *Scorpio* (*Androctonus*) *madagascariensis* by Gervais (1844). This was followed by another description of a single species by Pocock (1889). A more important contribution was that of Kraepelin (1900), in which several species of the genus *Grosphus* were described. In his comprehensive contribution to the scorpions of Madagascar, Fage (1929) dealt with all the species known to that date and described a new variety of *Grosphus limbatus*, which he named *annulata*. This variety has later been raised to species rank and named *Grosphus annulatus*. In the studies by Lourenço (1995 and particularly 1996), several new scorpion taxa were described from the Madagascar fauna, and the number of scorpion species from there increased by more than three times. The genus *Grosphus*, however, has remained more stable in its composition and after the monograph of Fage (1929), only two further species have been described (Lourenço, 1996, 1999). Another new species of *Grosphus* from the Malagasy fauna is presented in the following in the paper.

TAXONOMIC TREATMENT

Grosphus garciai sp. n.

Figs 1-11

MATERIAL: Male holotype and juvenile paratype from Madagascar, Province of Majunga, Ankarafantsika Reserve, Forest Station Ampijoroa, Ampijoroa village (16°18'45.2'' S - 46°48'54.2'' E), 73 m., Gerardo García Herrero coll., June/2000. Deposited in the Muséum d'Histoire naturelle, Genève (MHNG).

ETYMOLOGY: Patronym in honour of Mr. Gerardo García Herrero, who collected the specimen.

DIAGNOSIS: Close to *Grosphus madagascariensis* (Gervais), distinguished by: (i) Yellowish to reddish yellow variegated, with an intense brownish pigmentation (*G. madagascariensis* is dark to blackish in colour); (ii) smaller size 'see Table I'; (iii) movable fingers of pedipalps with 13 oblique rows of granules, in contrast to 12 in *G. madagascariensis*; (iv) pedipalp and metasoma carinae weaker and with much less conspicuous spinoid granules; intercarinal tegument much less granular; (v) lobe at the base of movable finger reduced.

DESCRIPTION (based on male holotype): Morphometric measurements, see Table I.

Coloration. Basically yellow to reddish yellow, variegated with intense brownish pigmentation over the entire body, pedipalps and legs. Prosoma: carapace dark yellowish variegated with spots more intensely marked laterally and behind the median eyes; eyes surrounded by black pigment. Mesosoma: dark yellowish with confluent brownish zones and one longitudinal yellowish stripe over tergites I-VI. Metasoma: all segments reddish yellow, variegated with brownish pigmentation over

TABLE I. Morphometric values (in mm) of the male holotype of *Grosphus garciai* sp. n. and of an adult male *G. madagascariensis* from Monangarivo.

	<i>G. garciai</i> sp. n.	<i>G. madagascariensis</i>
Total length	32.0	54.0
Carapace:		
- length	4.4	6.1
- anterior width	3.0	4.4
- posterior width	5.0	7.2
Metasomal segment I:		
- length	2.7	4.4
- width	2.7	3.9
Metasomal segment V:		
- length	4.8	6.6
- width	2.7	3.8
- depth	2.5	3.5
Vesicle:		
- width	2.3	3.4
- depth	2.2	3.1
Pedipalp:		
- Femur length	4.1	5.8
- Femur width	1.2	1.6
- Tibia length	4.9	7.0
- Tibia width	1.9	2.4
- Chela length	8.2	11.5
- Chela width	2.4	3.4
- Chela depth	2.1	3.2
Movable finger:		
- length	4.3	6.3

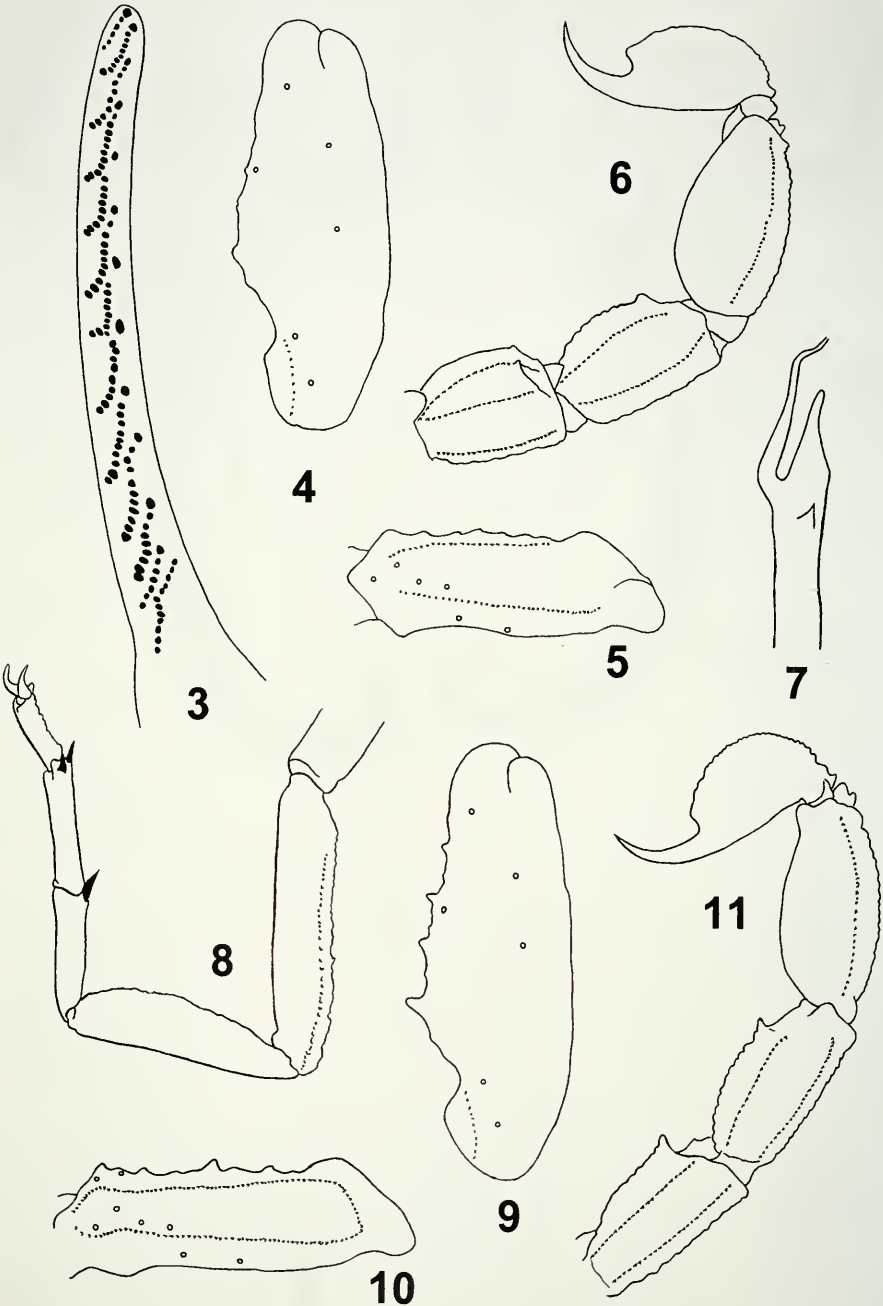


FIGS 1-2

Grosphus garciai sp. n., male holotype, dorsal and ventral aspects

ventral and lateral aspects; a triangular brownish spot present on the dorsal face of each segment. Vesicle reddish yellow with some scattered light brownish spots; aculeus reddish yellow. Venter: coxapophysis, sternum, genital operculum and pectines yellowish; sternites reddish yellow; sternite V with a white approximately triangular basal spot. Chelicerae yellowish, variegated with dark pigmentation; fingers reddish. Pedipalps: mostly reddish yellow variegated with brownish pigmentation. Legs yellowish variegated with light brownish pigmentation.

Morphology. Carapace moderately to intensely granular; anterior margin with a weak median concavity. All carinae weak; furrows moderate to weak. Median ocular tubercle anterior to the centre of the carapace; median eyes separated by one ocular diameter. Three pairs of lateral eyes. Shape of sternum in between subtriangular and sub-pentagonal. Mesosoma: tergites with thin but intense granulation. Median carina moderate on all tergites. Tergite VII pentacarinat. Venter: genital operculum formed by two subtriangular plates. Pectines: pectinal tooth count 18-19;



basal middle lamellae of each pecten not dilated. Sternites smooth, with moderately elongated, slightly oval stigmata; sternite VII with four vestigial carinae and a few thin granules. Metasoma: segments I and II with 10 carinae, moderately crenulate. Segments III and IV with 8 carinae, moderately crenulate. Segment V with 5 carinae, the dorsal one being only weakly marked. Dorsal carinae on segments I-IV with a moderately pronounced posterior spinoid granule. Intercarinal spaces moderately granulated. Telson with scattered granules on lateral and ventral surfaces; dorsal surface smooth; aculeus moderately curved and shorter than the vesicle; subaculear tooth small. Cheliceral dentition characteristic for the family Buthidae; two distinct basal teeth present on the movable finger, the more basal one being reduced (for a comparison see Vachon, 1963); ventral aspect of finger and manus densely covered with, long setae. Pedipalps: femur pentacarinata; tibia with carinae represented by some spinoid granules only on the internal face; chelae smooth without carinae; all sides weakly granular to smooth. Dentate margin on movable finger composed of 13 oblique rows of granules. Trichobothriotaxy; orthobothriotaxy A- α (see Vachon, 1973, 1975). Legs: tarsus with numerous short thin setae ventrally. Tibial spurs present on legs III and IV; pedal spurs present on legs I to IV; all spurs strong.

Variation. The juvenile male paratype, shows a pectinal tooth count of 20-20. Its carinae are more strongly marked than in the adult, as is the case in juveniles of several buthid species.

COMMENTS: Preliminary examination of the specimens, first lead me to the conclusion that they could only be juveniles of *G. madagascariensis*. Many external traits such as the number of pectinal teeth and general morphology are similar in those two species (patterns of pigmentation can sometimes be different between juveniles and adults). However, the dissection of the holotype showed, that its genital organs, including hemispermaphores, were completely formed, proving that the type specimen is adult.

ECOLOGY: The species was found at night in dry forest with a sandy soil. It was collected together with *Grosphus madagascariensis* (Gervais) and *Grosphus bistriatus* Kraepelin (also deposited in the MHNG).

FIGS 3-11

3-8. *Grosphus garciai* sp. n., male holotype. 3. Dentate margin of movable finger. 4-5. Tibia and femur, dorsal aspect, showing trichobothrial pattern. 6. Metasomal segments III-V and telson, lateral aspect. 7. Distal region of hemispermaphore showing hook and flagellum. 8. Leg IV with spurs (in black). - 9-11. *Grosphus madagascariensis* (male). 9-10. Tibia and femur, dorsal aspect, showing trichobothrial pattern. 11. Metasomal segments III-V and telson, lateral aspect.

KEY TO THE KNOWN SPECIES OF THE GENUS *GROSPHUS*

1. Pectines with a maximum of 21 teeth 2
- (1) Pectines with more than 22 teeth 4
2. Coloration yellowish to reddish yellow, variegated with a brownish pigmentation; total length averaging 30 mm. *G. garciai* sp. n.
- (2) Coloration dark, from reddish brown to dark brown; total length averaging 50 mm 3
3. Coloration reddish brown to dark brown; metasomal segment I longer than wide; basal middle lamellae of pectines in females oval
..... *G. madagascariensis*
- (3) Coloration reddish brown with some lighter spots; metasomal segment I wider than long; basal middle lamellae of pectines in females sub-quadrangular *G. hirtus*
4. Coloration blackish throughout; pectines with 30 to 40 teeth; total length more than to 90 mm *G. grandidieri*
- (4) Coloration from reddish-brown to yellowish, never blackish; total length less than 90 mm 5
5. Mesosoma with homogenous coloration, reddish-brown or yellowish 6
- (5) Mesosoma with one blackish longitudinal median stripe, or with two blackish longitudinal lateral narrow stripes 9
6. Total length more than 70 mm; mesosoma reddish brown; basal middle lamellae of pectines in females two times longer than wide at their base
..... *G. flavopiceus*
- (6) Total length less than 60 mm; mesosoma yellowish; basal middle lamellae of pectines in females three times longer than wide at their base 7
7. Metasomal segment V and telson pale yellowish *G. intertidalis*
- (7) Metasomal segment V and telson with blackish spots or blackish throughout 8
8. Metasomal segment V and telson with blackish spots *G. annulatus*
- (8) Metasomal segment V and telson blackish *G. feti*
9. Mesosoma with a wide blackish longitudinal median stripe; basal middle lamellae of pectines in females three times longer than wide at their base and covering the 4 proximal teeth *G. limbatus*
- (9) Mesosoma with two narrow blackish longitudinal lateral stripes; basal middle lamellae of pectines in females two times longer than wide at their base and covering only the proximal tooth *G. bistratus*

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